

hanging wall of black carbonaceous shale and a foot wall of grey magnesian limestone, which is probably of lower carboniferous age. The ore is richest and most abundant immediately under the black shales. Other minerals observed are native silver, argentite, galena, sphalerite, siderite, barite, and calcite.—Post-Laramie deposits of Colorado, by Whitman Cross. This paper, published by permission of the director of the United States Geological Survey, deals with some beds occurring between the lowest eocene and the marine cretaceous deposits, which have hitherto been classed with the Laramie formation of the Rocky Mountains. The age of the firm grey sandstones and coal-measures of the latter has long been doubtful, and they have been variously described as secondary and tertiary. In the Denver region, two beds are found overlying the Laramie unconformably, the one consisting of a pebbly conglomerate, the other of débris of andesitic lavas; they have been termed the Denver and Arapahoe formations respectively. Their equivalents have been found in various other parts of Colorado. When, after the continental elevation which caused the retreat of the Laramie seas, sedimentation began again, it was in comparatively small seas or lakes. Succeeding the first period of lake-beds came a time of great volcanic outbursts over a large area. The length of geologic time occupied may not have been very great, but the extent of country in which eruptions occurred at this time, and the great variety of lavas found in the Denver and Middle Park regions, argue for the decided importance of the event as a dynamic manifestation. The writer wishes to advocate the restriction of the term Laramie, in accordance with its original definition, to the series of conformable beds succeeding the marine Montana cretaceous, and the grouping of the post-Laramie lake beds in another series, to which a comprehensive name shall eventually be given.—On the alkali-metal pentahalides, by H. L. Wells and H. L. Wheeler. With their crystallography, by S. L. Penfield. An account of the preparation and properties of compounds of the formulæ CsI_5 , CsBr_5 , $\text{CsCl}.\text{Cl}_3\text{I}$, $\text{RbCl}.\text{Cl}_3\text{I}$, $\text{KCl}.\text{Cl}_3\text{I}$, $\text{NaCl}.\text{Cl}_3\text{I}.\text{I}.\text{H}_2\text{O}$, $\text{LiCl}.\text{Cl}_3\text{I}.\text{H}_2\text{O}$. The first is triclinic, the third, fourth, and fifth are monoclinic, and the Na salt is orthorhombic.—Fossils in the "archæan" rocks of Central Piedmont, Virginia, by N. H. Darton. Remains of crinoids belonging to the upper Ordovician fauna were found in the roofing slate of Arvon, Buckingham County, Virginia, which has hitherto been classified as Huronian.—Notes on the Cambrian rocks of Virginia and the southern Appalachians, by Chas. D. Walcott. It is shown that towards the close of middle Cambrian time, and during upper Cambrian time, there was a decided continental movement, resulting in the depression of the interior continental plateau, and that this was accompanied by the formation of conglomerates of the older Cambrian rocks in the valley of the St. Lawrence, and by a great deposition of sediments of later Cambrian time in the southern Appalachian region.—Synthesis of the minerals crocoite and phoenicochroite, by C. Ludeking, Ph.D. This was accomplished by exposing for several months to the air a solution of lead chromate in caustic potash in a flat dish. A mixture of the two kinds of crystals resulted, which could be easily sorted by means of a pincette.—A hint with respect to the origin of terraces in glaciated regions, by Ralph S. Tarr. Tracing a resemblance between the flood terraces of the Colorado in Texas, and the glacial terraces of the Connecticut.—Occurrence of a quartz boulder in the Sharon coal of north-eastern Ohio, by E. Orton.—A method of increasing the range of the capillary electrometer, by John Whitmore. An account of some experiments performed in the Sloane Physical Laboratory of Yale College, with a view towards improving the mercury and sulphuric acid electrometer as constructed by Lippmann and Pratt. Instead of having alternate bubbles of the two liquids, the surface of the mercury exposed to oxygen polarization was increased by blowing the tube into bulbs at the junction. A series of bulbs was blown, spaced at equal intervals along a capillary tube, the diameter of the bulbs being two centimetres, that of the tube 0.6 mm.; then the tube was so bent, that the whole contained as many U-shaped parts as there were cells. One arm of each U was provided with a bulb, which was situated at a distance of two-thirds the height of the U from the base. The apparatus was filled by connecting it with an aspirator, and drawing in sufficient mercury to half fill each bulb, after which dilute sulphuric acid was added by the same means. Platinum electrodes were used, and the variations in the height of the mercury columns produced by the E.M.F. examined, were read by means of a cathetometer. The deflection produced by a standard Clark cell was 3.20 mm. The range of the instrument

is limited by the E.M.F. required to produce continuous electrolysis, but it was found that it could be considerably increased by using a larger number of cells in series. It is possible to determine with this electrometer the E.M.F. of a cell correctly to 0.001 of a volt.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, June 16.—Prof. A. Crum Brown, F.R.S., President, in the chair.—The following papers were read:—Contributions to an international system of nomenclature. The nomenclature of cycloids, by H. E. Armstrong. An account was given of the proceedings at the recent Conference on Chemical Nomenclature at Geneva, and attention was directed to the significance of the chief resolutions. A report of the conclusions arrived at by the Conference has already appeared in NATURE (this vol., p. 56).—The production of pyridine derivatives from the lactone of triacetic acid, by N. Collie and W. S. Myers. The product of the interaction of ammonia and triacetic lactone is most probably an $\alpha\gamma$ -dihydroxy- α -picoline. By the action of phosphorus oxychloride on this substance a compound possessing all the properties of a dichloropicoline is obtained, and on passing this, together with hydrogen, over heated zinc-dust, α -picoline boiling at $128-129^\circ$ is produced. The melting points of the platinum- and aurichlorides, obtained from the synthetical alkaloid, agree with those given by the corresponding compounds prepared from pure α -picoline which was made by heating pyridine methiodide.—The fermentation of arabinose by *Bacillus ethaceticus*, by P. F. Frankland and J. MacGregor. The products are qualitatively the same as were obtained in the fermentations of glycerol by the same organism, consisting of ethyl alcohol, acetic acid, carbon dioxide, hydrogen, and traces of succinic acid, together with another acid which was not identified. When the fermentation is conducted in a closed space a notable proportion of formic acid also occurs among the products. In this case the products are formed approximately in the proportions— $3\text{C}_2\text{H}_6\text{O}$, $3\text{C}_2\text{H}_4\text{O}_2$, $4\text{CH}_3\text{CO}_2\text{H}$, the formic acid as well as the carbon dioxide and hydrogen found being all collected together as formic acid in this statement. In the fermentations conducted in flasks plugged only with cotton wool, on the other hand, the alcohol and acetic acid were formed in the proportion $2\text{C}_2\text{H}_6\text{O}$, $3\text{C}_2\text{H}_4\text{O}_2$. It appears, therefore, that in the fermentation of arabinose by *Bacillus ethaceticus*, the proportion of acetic acid to alcohol is greater than in that of dextrose, and still greater than in the cases of mannitol and glycerol, but less than in that of glyceric acid.—Resolution of lactic acid into its optically active components, by T. Purdie and J. W. Walker. The authors have resolved ordinary inactive lactic acid into lævo- and dextro-lactic acid by taking advantage of the different solubilities of the strychnine salts of these components. Strychnine lævolactate is considerably less soluble in water than the dextrolactate, although both salts may be crystallised. By fractional crystallization of the mixed salts and subsequent removal of the strychnine from the crystals and mother liquor, by means of ammonia or barium hydrate, solutions were obtained which were respectively dextro- and lævo-gyrate. The dextrolactate yielded a zinc dextrolactate having the same composition and solubility as zinc sarcosylactate. A well-defined dextro zinc ammonium salt of the composition $\text{Zn}.\text{NH}_4(\text{C}_3\text{H}_5\text{O}_3)_2.2\text{H}_2\text{O}$ having the specific rotatory power $[\alpha]_D^{20} = +6.49$ (approx.) was prepared. The dextrogyrate salts yield a lævoglyrate acid, which, like sarcosylactic acid, gives an oppositely active anhydride. The quantities of oppositely active acids separated from each other by means of the strychnine salts possessed equal amounts of optical activity. Fermentation lactic acid is thus shown by analysis to consist of two oppositely active isomeric acids, one of which is identical with dextrogyrate sarcosylactic acid, and the other with the lævoglyrate acid prepared by Schardinger by the bacterial decomposition of cane sugar.—A new method for determining the number of NH_2 groups in certain organic bases, by R. Meldola and E. M. Hawkins. In order to ascertain the number of NH_2 groups present in certain organic bases the authors propose to form the azoimides; on analysis of these substances, the number of amidogen groups which have been diazotized, can be determined. For example, paradiamidoazobenzene $(\text{NH}_2.\text{C}_6\text{H}_4)_2\text{N}_2$ was diazotized and converted into

tetrazoperbromide in the usual way. This latter substance, by the action of ammonia, yields lustrous silvery scales of the azoimide.



The analysis of this substance proves without doubt that two amidogen groups were present in the original base.—The existence of two acetaldoximes. Second notice, by W. R. Dunstan and T. S. Dymond. The authors have more fully investigated the change undergone by acetaldoxime on heating (see NATURE, this vol., p. 94). The pure crystals melt at 46°5'; after heating at 100° for a few minutes the liquid does not begin to crystallize until 13°. On separating the crystals now formed, and cooling the liquid still more a further crop of crystals is obtained. Each of these separations is found to melt at 46°5'. Acetaldoxime therefore exists in two modifications, one, the crystalline form melting at 46°5', and the other, a liquid form which the authors find cannot be obtained in a pure state, as when it approaches purity it partially reverts to the modification melting at 46°5'.—The dissociation constants of organic acids, by J. Walker. The author has measured the dissociation constants of a number of organic acids and ethereal salts.—Note on the preparation of alkyl iodides, by J. Walker. The author has devised a method for conveniently and rapidly preparing considerable quantities of methyl and ethyl iodides. The apparatus employed consists of a modified fat extraction apparatus, by means of which the iodine is dissolved by the condensed alcohol, and runs into a vessel containing the phosphorus and alcohol. The method gives a good yield, and may be applied to the preparation of higher iodides.—An examination of the products obtained by the dry distillation of bran with lime. Preliminary communication, by W. F. Laycock and F. Klingemann. On distilling a mixture of bran and quick-lime, a black oil, floating on an aqueous solution is obtained. The aqueous solution smells of herring brine, contains much ammonia, and on boiling evolves inflammable gases. The oil is evidently a complex mixture, and has not yet been separated into its constituents.—The atomic weight of palladium, by G. H. Bailey and T. Lamb.—The action of sulphuryl chloride on acetotoluidine and acetparatoluidine, by W. P. Wynne.

PARIS.

Academy of Sciences, July 18.—M. d'Abbadie in the chair.—On a slight additive correction which may have to be applied to the heights of water indicated by sea-gauges, when the swelling or chopping agitation of the sea reaches a great intensity: case of a choppy sea, by M. J. Boussinesq. In this second case the correction is much smaller than in the former, amounting to not more than 0·1 mm. in an extreme case.—Preparation and properties of proto-iodide of carbon, by M. Henri Moissan. If an exhausted sealed tube containing crystals of the tetra-iodide of carbon be heated in an oil bath to 120°, iodine is liberated and condenses in the cooler portion of the tube, while less volatile crystals of the proto-iodide of carbon are produced, corresponding to the formula C₂I₄. To obtain greater quantities, the tetra-iodide is reduced by silver powder. The substance obtained presents itself in beautiful pale yellow crystals of density 4·38, fusing at 185°, and volatile without decomposition below their point of fusion. By slow volatilization in a vacuum at a temperature between 100° and 120°, transparent crystals are produced, some of which form highly refracting hexagonal tablets. The proto-iodide is very soluble in carbon bisulphide, tetrachloride, and ordinary ether, which, by cooling, gives good crystals. The new compound is very stable, being not oxidized by potassium permanganate, and boiling chromic and nitric acids.—On one of the reactions of spermine, by M. Duclaux.—On a fossil baboon of the quaternary phosphorites of Algeria, *Macacus trarsensis*, by M. A. Pomel.—Project of meteorological observatories on the Atlantic Ocean by Albert I., Prince of Monaco. A proposal to establish a station on the Azores as soon as the projected cable is laid, and also on Madeira, the Canaries, Bermuda, and the Peak of Teneriffe. It is expected that the prediction of cyclones will be much facilitated, and Monaco is suggested as a centre for the collection and distribution of the information obtained.—On the specific heat and the latent heat of fusion of aluminium, by M. J. Pionchon. The total quantity of heat required to raise 1 gr. of aluminium from 0° to its fusing point, 625°, is 239·4. The

latent heat of fusion is very large, being equal to that of water, viz., 80 cal.—On the measurement of the dielectric constant, by M. A. Perot. The further value obtained for glass was 2·39, which, obtained by means of a glass prism weighing 65 kg., agrees very well with that obtained from very rapid oscillations. The values obtained by these two methods, being unaffected by residual charges, are more reliable than those derived from the static, the attraction, and the ballistic galvanometer methods.—On the principle of maximum work, by M. H. Le Chatelier. An examination of the bearing of certain thermodynamic laws on Berthelot's principle, showing that the contradiction between them is only apparent.—On a basic nitrate of calcium, by M. A. Werner.—On the efflorescence of sulphate of copper and some other metallic sulphates, by MM. H. Baubigny and E. Pechard.—On the decomposition of the basic nitrates by water, by MM. G. Rousseau and G. Tite.—On phosphopalladic combinations, by M. E. Fink.—On the mechanical contrast between the radical cyanogen and the chloroid elements, by M. G. Hinrichs.—The influence of the substitution of the methyl group for one benzene hydrogen on the properties of orthotoluidine, by M. A. Rosenstiehl.—On the instability of the carboxyl in the phenol acids, by M. P. Cazeneuve.—On preserved ferruginous mineral waters, by M. J. Riban.—On a new leucomaine, by M. A. B. Griffiths.—Effects of sudden release on animals placed in compressed air, by M. G. Philippon. It was found that although rabbits subjected to a pressure of six or eight atmospheres were unaffected if the pressure was gradually released, a sudden expansion was followed by almost instantaneous death. The cause of death appears to be the mechanical expansion of the gas contained in the vessels, which, in the case of gradual release, is eliminated by the lungs in a few minutes.—On the immediate reparation of losses of intra-osseous substances, with the aid of aseptic bodies, by MM. S. Duplay and M. Cazin.—The coxal gland of the scorpion and its morphological relations to the excretory glands of the Crustacea, by M. Paul Marchal.—The avalanche of the Têtes-Rousses. Catastrophe of St. Gervais-les-Bains (Haute-Savoie), by M. F. A. Forel.—On certain forms of filling-up observed in some lakes of the Pyrenees, by M. Emile Belloc.

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